(4) The form of the central stone is immaterial in discussing the plan. At a temple observatory, what was chiefly necessary was to mark the exact centre of the circle. Where no "cove" was erected, an upright stone would suit well. Where neither was present, the priest-astronomer would simply stand on the spot to make his observations. The present fashion of placing a large boulder on the flat in the centre of the Gorsedd seems reminiscent of both the "cove" and the later kist.

(5) "Myfyr Morganwg" is only to be followed so far as he can produce some earlier authority. He tried to mix the contents of the "Asiatic Researches" with those of Welsh tradition. I have before me a plan of the Pontypridd circle, published in the second quarter of the last century, in which the three station stones, or sunrise stones, form alignments to the equinox, May, and November.

(6) The bards were not allowed to sit in a Gorsedd; they were to stand uncovered, head and feet.

(7) I did not mean that the process of "re-codifying or otherwise dealing with the bardic traditions" was in operation only from the twelfth to the nineteenth century. It seems very likely that there was a larger body of Gorsedd traditions known in the twelfth century than we find at any subsequent period. Again, I applied the epithet "voluminous" to the whole stock of printed and manuscript materials on the subject still extant. They have "grown," not to any large extent by addition or accretion, but by the multiplication of versions or recensions of what was recited at the Gorsedd meetings, as was the fixed rule. There is much work to be done by way of collating these recensions. I have an impression that the recital of the Gorsedd traditions proper would not have occupied a longer time than an old-time sermon. The only considerable additions concern the rules of poetry. There is no evidence, except the indirect evidence respecting the solstitial year, that the conventional instructions about the Gorsedd circle itself have been subjected to any revision. This is distinctly stated to be a matter of minor importance—the circle with its ceremonies. The following words, translated from a Welsh extract from an old book at Raglan Castle, before that place was destroyed by Cromwell's forces, shows the attitude of the bards towards the subject here under discussion:—

"Now follows an account of things that appertain to institutional ceremonies, and that accord with the reason and inherence observable in the reminiscence and customs of the bards of the Island of Britain; but which, nevertheless, are not considered as indispensably requisite parts of the system; because every truth and knowledge—every recollection and intention—as well as every art and science, may be acquired without them:—still they corroborate and illustrate reminiscences and primary regulations; for which reason, it is deemed laudable to perpetuate them in memory and usage; especially as they comprise the ancient forms transmitted, by the retentive memory of Gorsedd" ("Iolo MSS.," p. 445).

Then the scribe begins the list of non-essentials as follows:—"It is an institutional usage to form a conventional circle of stones, on the summit of some conspicuous ground," and he gives complete details. This is not the tone of a scribe who was conscious of any weakness in the traditional account.

I take no serious exception to anything that Mr. Lewis says. He has himself furnished very valuable data for this inquiry. But a better theory than an "accidental sort of way" must be found to explain highly finished and polished statements which, like pebbles in glacial drift, speak of the remotest origin.

JOHN GRIFFITH.

Llangynwyd, Glam.

MARINE ZOOLOGY AT THE CAPE.[1]

THE third volume of reports on the Cape marine fauna contains ten papers published between 1904 and 1905. Of these memoirs, two dealing with eighteen new species of fish and the development of South African fishes, are by Dr. Gilchrist, to whose enterprise and ability these sustained and extended investigations of the resources of the Cape seas are largely due. In this work he has been ably seconded by European colleagues. Prof. McIntosh contributes two papers on the polychæt annelids; Prof. Hickson a second report on the Alcyonaria; Prof. Jeffrey Bell three contributions, dealing respectively with the echinoid, asteroid, and ophiuroid echinoderms; Mr. Stanley Gardiner publishes a careful study of the turbinolid corals; and Prof. Cleve submits a first instalment of a study of the South African marine plankton.

Dr. Gilchrist's second contribution to a knowledge of the life-histories of the Cape fish contains several matters of interest, although he has only succeeded in referring nine of the eighteen stages or eggs he describes to known species. The development of the saury-pike (*Scombresox saurus*) is worth noticing for

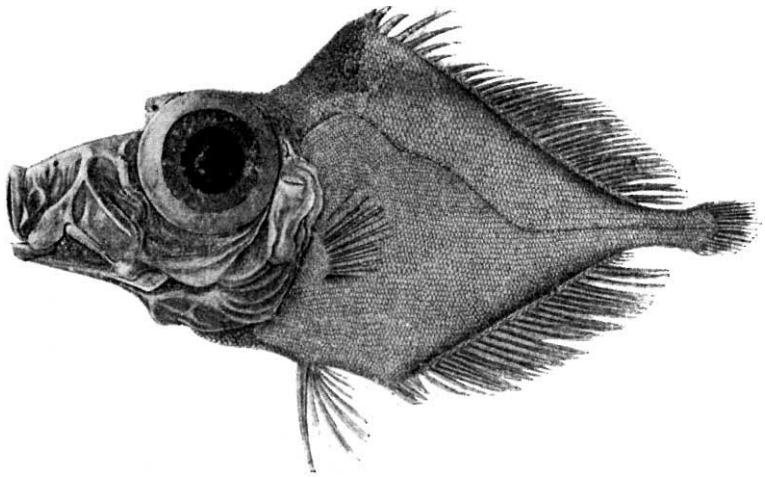

FIG. 1.—*Cyttosoma Boops*, ng. eb sp. From "Marine Investigations in South Africa."

two reasons. In the first place, the young fish before hatching keeps up a rapid and almost constant movement of one pectoral fin, and when hatched, keeping its tail well submerged, it skims the surface with its mouth as if in search of food. The second peculiarity of the saury, if well founded, is of greater interest, and consists in the presence of blue pigment arranged in chromatophores, massively developed on the dorsal surface and sparsely below. The presence of an indubitable blue pigment concentrated in cellular elements is probably a new fact in animal coloration, and one that suggests how wide a field of investigation is afforded by the phenomena of pigmentation in fish. Another noteworthy feature of this article is the account of cannibalism prevalent among the unborn young of *Cataetyx messieri*. It appears that this deep-sea fish is viviparous. In the one case described, the right ovary consisted of a mass of undeveloped bright red eggs with a single larva coiled up in a dense mucous substance, whilst the left ovary contained seven larvæ also strongly flexed and embedded in mucus. When these were detached it

[1] Cape of Good Hope, Department of Agriculture. "Marine Investigations in South Africa." Vol. iii. Pp. 269+45 plates. (Cape Town: The *Cape Times*, Ltd., 1905.)

was found that in one case the larva had swallowed a smaller one, and that the others had partially digested their younger fellows. Further details of this habit are promised.

The papers on Polychæts are of interest, chiefly as affording further confirmation of the prevalence of European forms, and even of their parasites, in South African waters. The luminous Chætopterus, for example, that occurs on the Devonshire coast and among the Channel Islands, is found between tide-marks in False Bay and Simon's Bay at the Cape. Many of our commonest littoral annelids are found under similar conditions on the shores of these bays. Fifteen out of the thirty-eight species here described are British, and the majority of the remainder are closely allied replacing forms. Where the agreement is so close it is rather curious to note that no mention is made of the presence of the common lugworm or of its allies.

Prof. Hickson's paper on the Alcyonaria is a continuation of his previous work on this branch of the Cape fauna. It contains, amongst other matter, descriptions of a new family, two new genera, and four new species. The new family, Malacogorgiidæ, is remarkable as comprising Gorgonians, or sea-fans, without any calcareous structures. Of more general interest is the combination of local and of widely diffused corals that occur in the Cape waters. At least six peculiar Cape species, belonging to four genera, are now known, one of which, *Alcyonium purpureum*, is impregnated by a soluble purple pigment which deserves fuller investigation. On the other hand, the affinities of the members of the group in this region with Atlantic, Indian, and even Antarctic Alcyonaria are clearly indicated. We may expect a further investigation of these difficult problems of distribution from the distinguished author of this work.

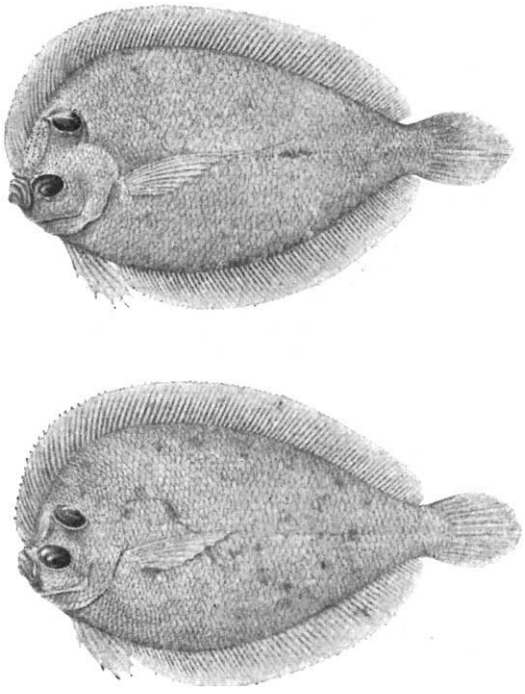

FIG. 2.—*Platophrys dimorphus*, n. sp. Upper figure, male; lower, female. From "Marine Investigations in South Africa."

The remaining papers can only be briefly summarised. Mr. Stanley Gardiner's work on corals is of that high standard to which his previous papers have accustomed us. It is based on a large series of comparisons, and is executed in the most careful and thoughtful manner, both as regards the skeletal and malacological characters. Prof. Jeffrey Bell reports the discovery of the echinid Palæolampas in a living state.

The plankton investigations by Cleve is a most useful summary of the distribution of the Copepoda found in South African seas, and also gives the percentage of this fauna that extends northwards, the result showing that in Mediterranean waters the percentage reaches more than 70, thus supporting the view enunciated by Cleve that the waters of the north temperate Atlantic "originate not from the Gulf Stream, but from the Benguela current, which is supposed to pass as an under-current below the waters of the Tropical Atlantic." Finally, a word of praise must be added for the forty-five excellent plates that adorn this work.

REFORM IN RURAL EDUCATION.

THE Gloucester conference on rural education in 1904 directed public attention to the need for adapting rural education to rural requirements. Several county education authorities have since instituted inquiries into the subject, chambers of agriculture have passed resolutions, and now the County Councils Association, through its Rural Education Sub-committee, has published a "Memorandum as to certain subjects suitable for the upper standards of elementary schools, and for evening schools in rural districts." This memorandum is worthy of careful examination. The case for reform may first be briefly stated.

It is a disturbing thought that during the past half-century scientific method has largely disappeared from rural elementary education. The child, whose education chiefly consisted in learning from what he saw and did in the field, sheepfold and farmstead, grew into a man who, though his range of view was limited, possessed a remarkable store of accurate first-hand knowledge upon those things which concerned his work in life. With the introduction of a system of compulsory schooling, in which knowledge was principally gained from the lips of the teacher, the scientific method of basing knowledge on individual experience largely disappeared. Now faculties, while easily developed in children, as easily become atrophied through disuse, and, under the present system, it is too often the case that lads as they leave school have neither the power of intelligent observation which is essential to success in rural industry, nor have they acquired an interest in country things. In the absence of such interests, the amusements of a town prove an irresistible attraction, and this, it is believed, has been one of the factors in bringing about rural depopulation and the scarcity of skilled men on the farms, while at the same time we meet in every London street with able-bodied out-of-works.

In the memorandum of the County Councils Association, nothing is said about less schooling, but the guiding principle in all the subjects of the curriculum is to be to *let surroundings teach*, and thus to put back scientific method into rural education. Geography and history are to be based on the physical features of, or the events associated with, the neighbourhood. In arithmetic, out-of-door measurement of land, crops, stacks, and cisterns is to be introduced. School-gardening is to be regarded not merely as instruction in the operations of gardening, but as a study of the growth of crops in relation to the soil.